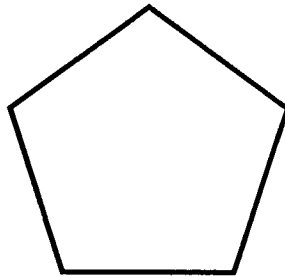


Testing Symmetry

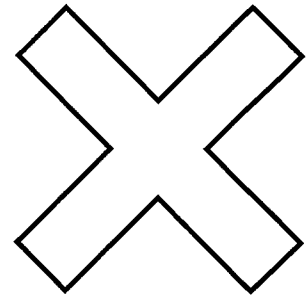
For each of the shapes below, mark in ALL the LINES of symmetry that you can find, and also identify the smallest angle of rotation if the shape has ROTATIONAL symmetry.



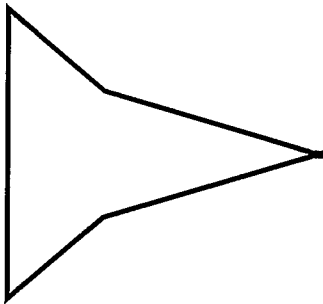
Angle:



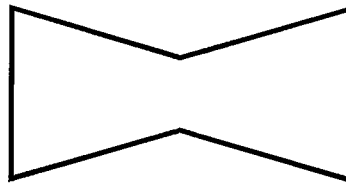
Angle:



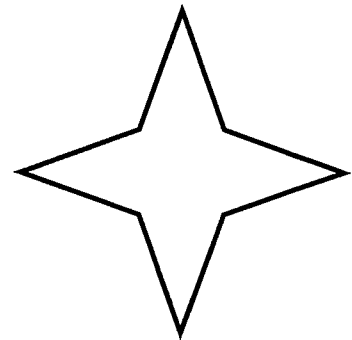
Angle:



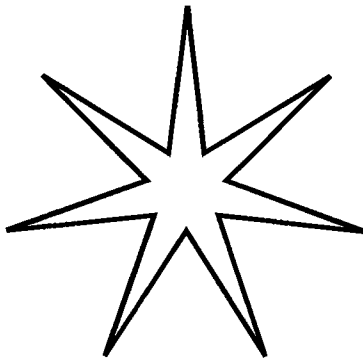
Angle:



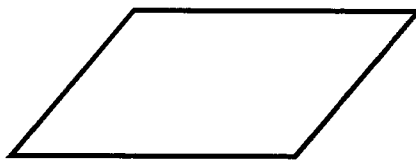
Angle:



Angle:



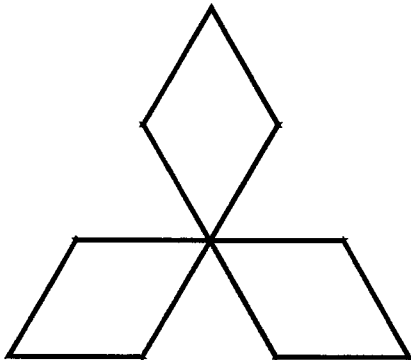
Angle:



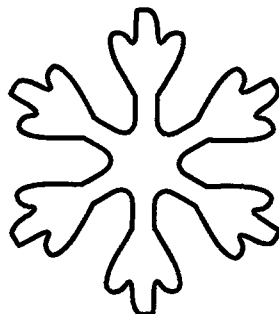
Angle:



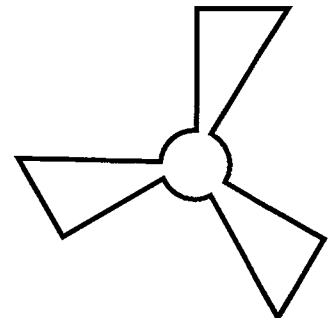
Angle:



Angle:



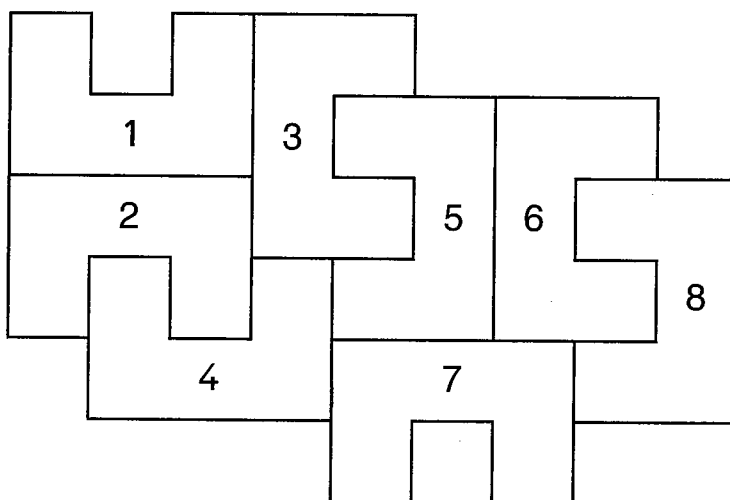
Angle:



Angle:

Pick the rotation

A shape **tessellates** when it fits together repeatedly without overlapping or leaving gaps.



1

Give three examples of how one of the tiles has been **rotated** to the tile next to it.

a

b

c

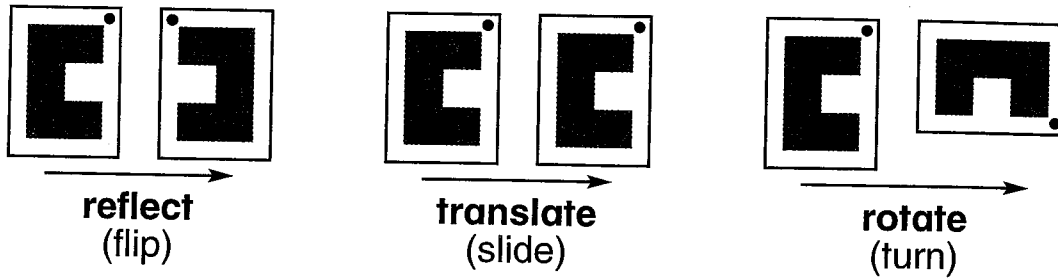
Sometimes, a rotation of 180° is the same as a **reflection**.

Sometimes, the new tile needs to be moved slightly after rotation to fit into the tessellation. This slide is called a **translation**.

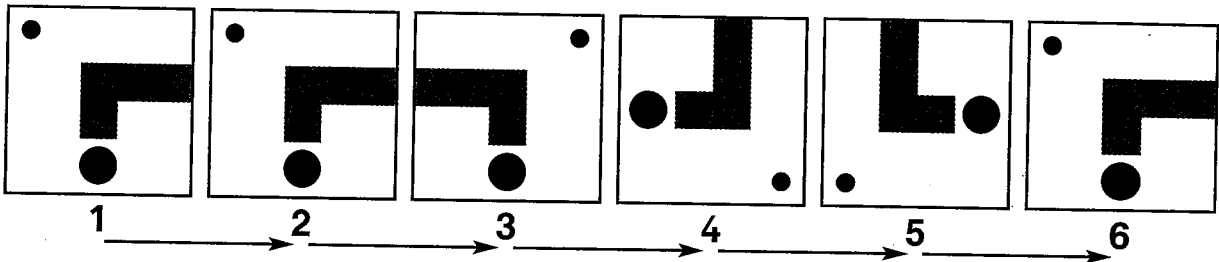
2

Indicate which of your rotating tile examples will also require a translation.

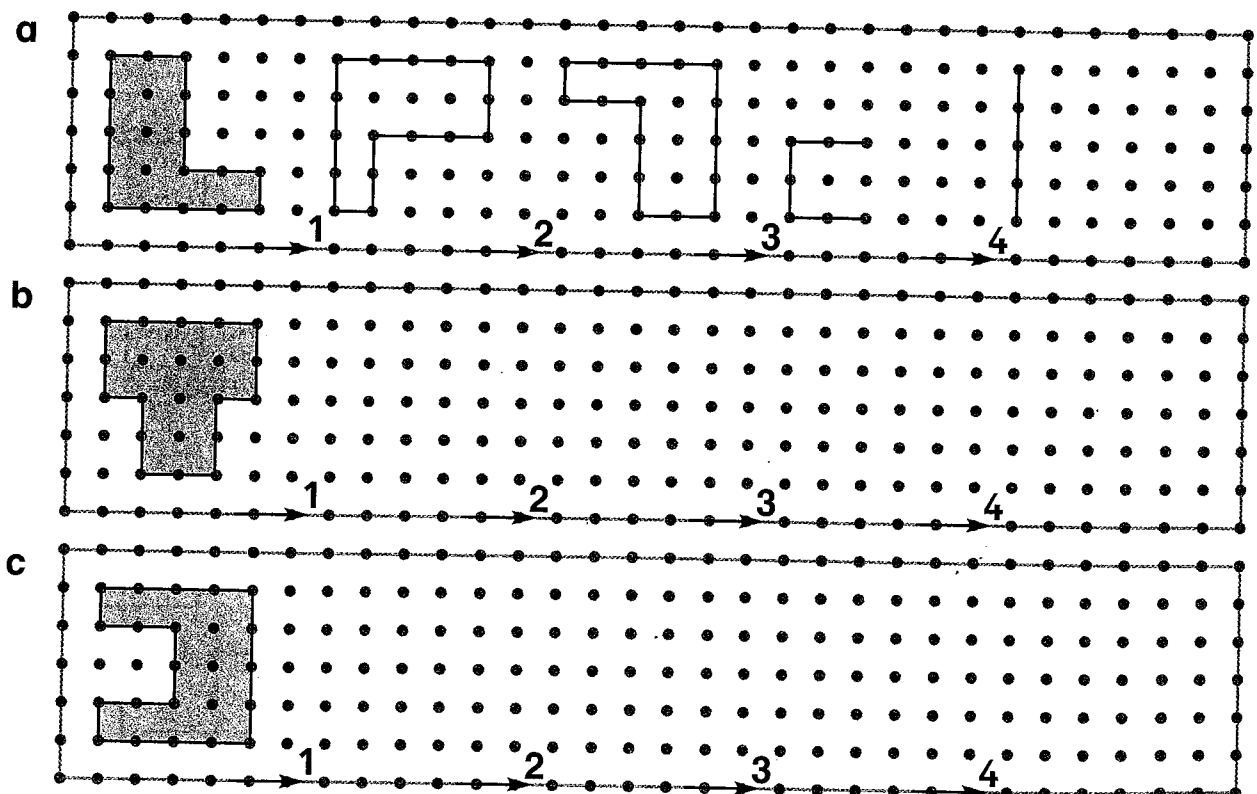
Rotating shapes



- 1** The tile below has been moved five times. Place a tick next to the moves that are **rotations**.

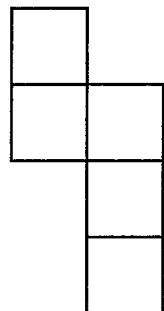
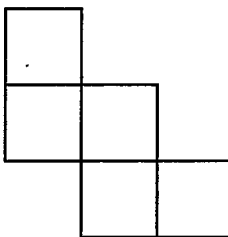
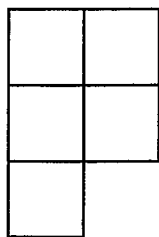
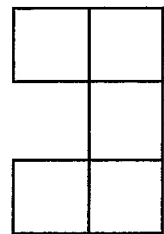
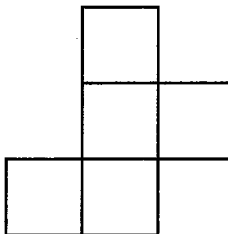
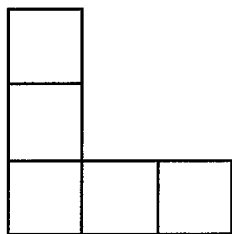
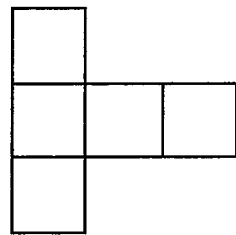
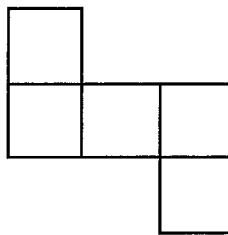
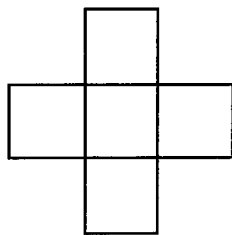
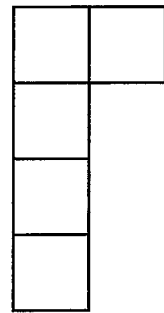
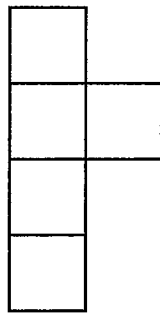


- 2** Draw each shape as it rotates through four one-quarter turns. The first example has been started for you.



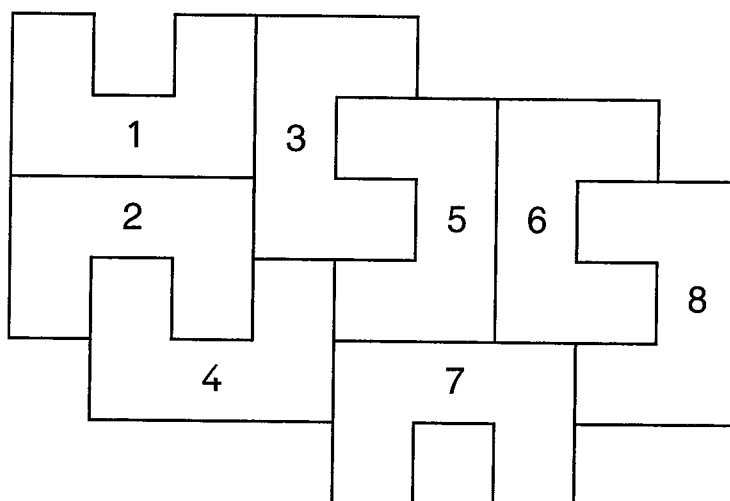
Pentomino rotations

Using centimetre grid paper, make tessellating patterns of these pentominoes with **rotations** and **translations** only. Use a different colour to show each move.



Pick the reflection

A shape **tessellates** when it fits together repeatedly without overlapping or leaving gaps.



1

Give three examples of how one of the tiles has been **reflected** to the tile next to it.

a

b

c

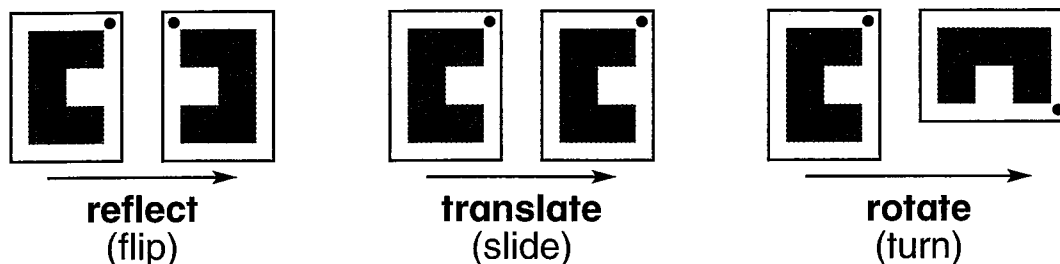
Sometimes, a **rotation** of 180° is the same as a reflection.

Sometimes, the new tile needs to be moved slightly after reflection to fit into the tessellation. This slide is called a **translation**.

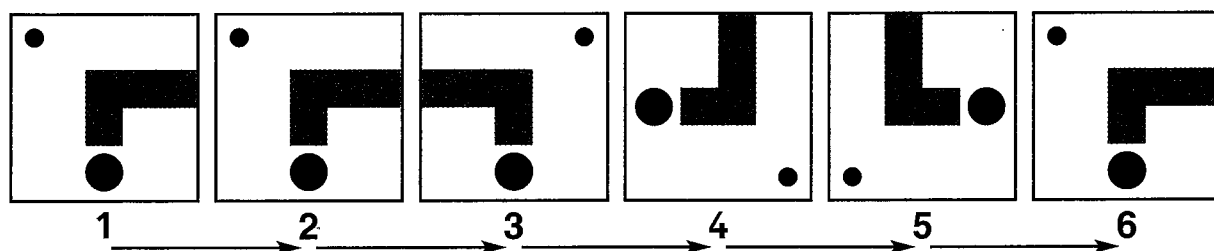
2

Indicate which of your rotating tile examples will also require a translation.

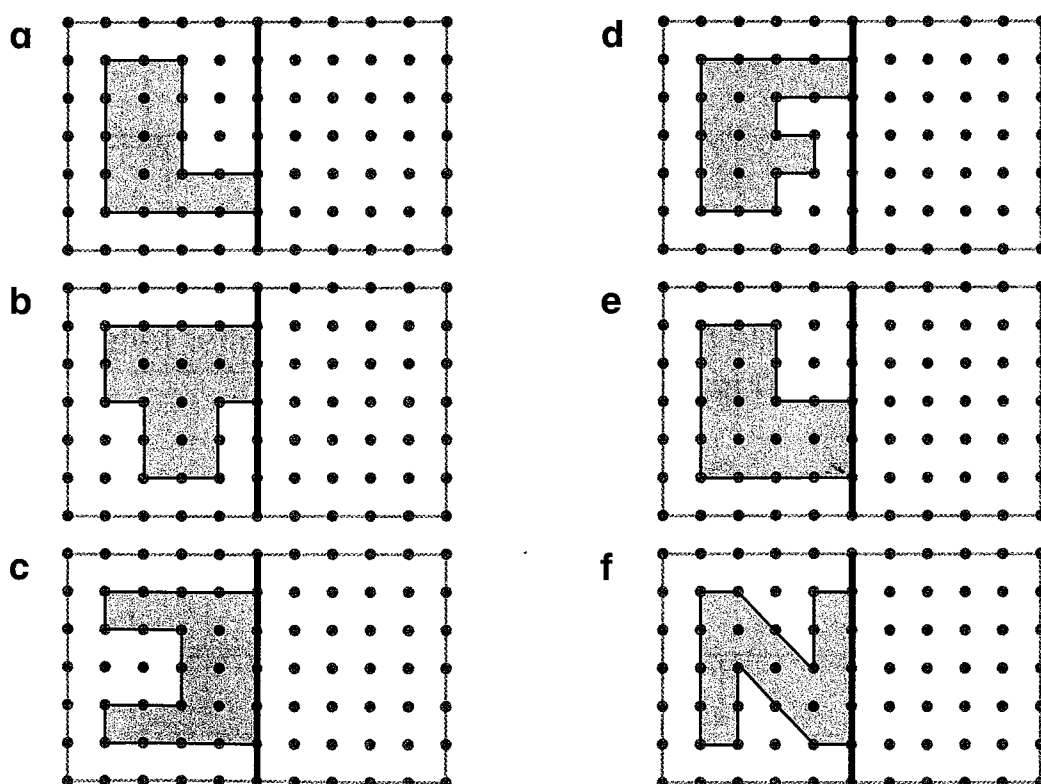
Reflecting shapes



- 1** The tile below has been moved five times. Place a tick next to the moves that are **reflections**.



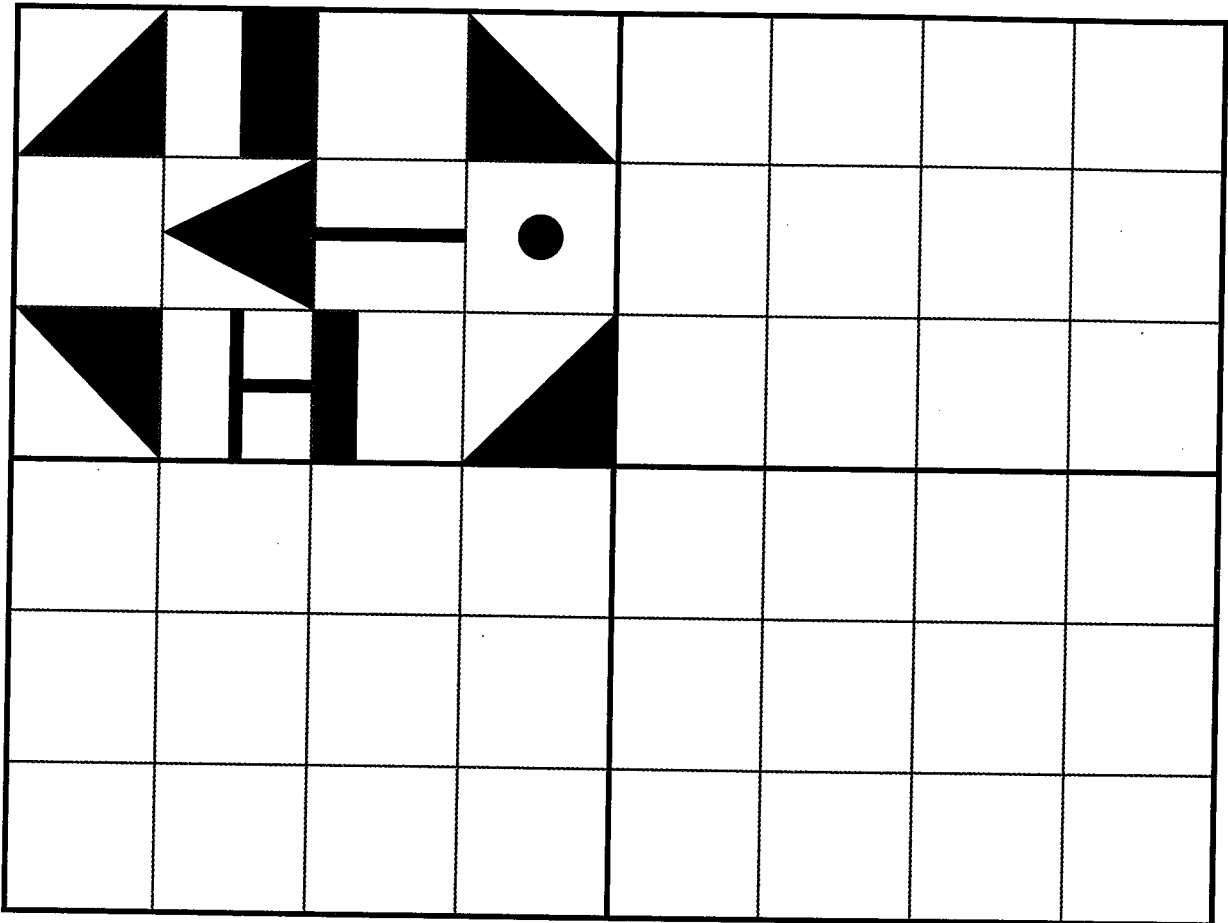
- 2** Draw reflections of these shapes, each reflected in the solid line indicated.



Reflections and symmetry

1

Complete the design below by looking into a mirror held along the **vertical axis of symmetry**, then the **horizontal axis of symmetry**.



You have created a design that has two axes of symmetry!

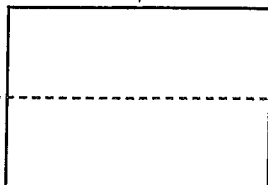
2

These shaded designs will be cut from folded paper. Predict what the whole design will look like after it is unfolded.

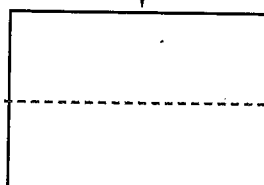
a



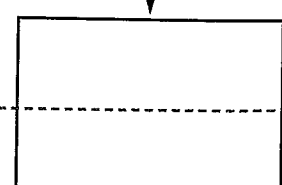
fold
line



b

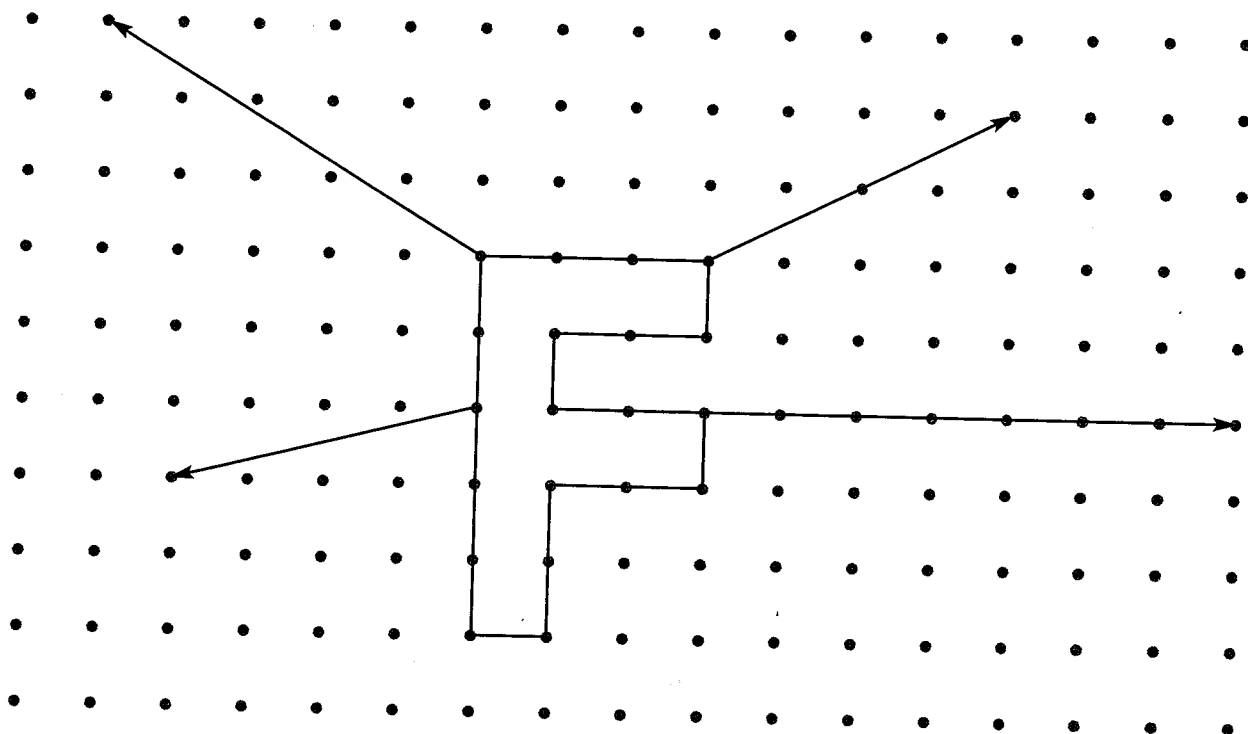


c



Translate to here ✂

- 1** Translate the point indicated to its new position on the dot grid. Then complete the rest of the F shape around this point.



- 2** Cut out these shapes and use them to make tessellating patterns using translation only.

